**AGENDA ITEM #4**

## SUPPORTING DOCUMENTATION FOLLOWS WITH: MANY PAGES

4. Discussion/Decision regarding Water Rate Analysis.

**DISCUSSION/ACTION AGENDA ITEM** 4

Date: August 10, 2011

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**Item:** WATER RATE ANALYSIS

**Background**: The current year budget includes funding to support a water rate analysis to consider rate adjustments to improve the financial integrity of the City's water system fund. That analysis is underway by Winzler & Kelly, and this will provide the opportunity to update the Council on the status of that analysis as well as seek direction in terms of the general configuration of the rates to be proposed.

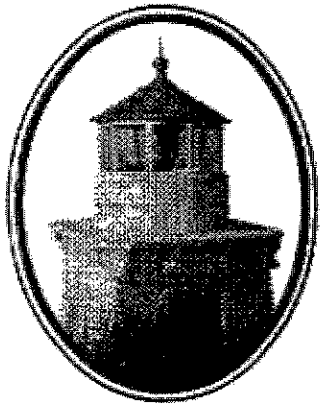
**Proposed Action:**

Hear presentation by Winzler & Kelly and give direction on the following:

- Should some water be provided with the base rate?
- Should the City keep a rate differential between inside and outside connections?
- Should water consumption charges increase with more water used?
- Should the annual CPI increase be kept as part of the rate structure?

**Attachment**

Preliminary Water Rate Analysis Power Point Presentation



# City of Trinidad
# Preliminary
# Water Rate Analysis

Presented August 10, 2011

By

WINZLER & KELLY

# Outline

1. Need for Rate Study
2. Trinidad Water System Statistics
3. Types of Water Rates
4. Current Trinidad Water Rates
5. Recent Rate Discussion
6. Revenues and Expenditures
7. Other Water Rate Considerations
8. Discussion/ Recommendations

# 1: Need for Rate Study

- The last rate study and restructuring was applied in 2002
- Expenses are currently exceeding revenues, depleting system reserves
- System improvements need to continually be made
- Current structure could improve promotion of conservation
- Difference between in-city and out-of-city rates is excessive (50% higher for out-of-city)

# 2: Trinidad Water System Statistics

- 316 active water connections
  (213 Inside City and 103 Outside City)
- All connections are metered
- Average Water Use per Connection ($ft^3$/month)

~ XX In Data being verified ~ XX Total

- Median Water Use Per Connection ($ft^3$/month)

~ XX Insi Data being verified ~ XX Total

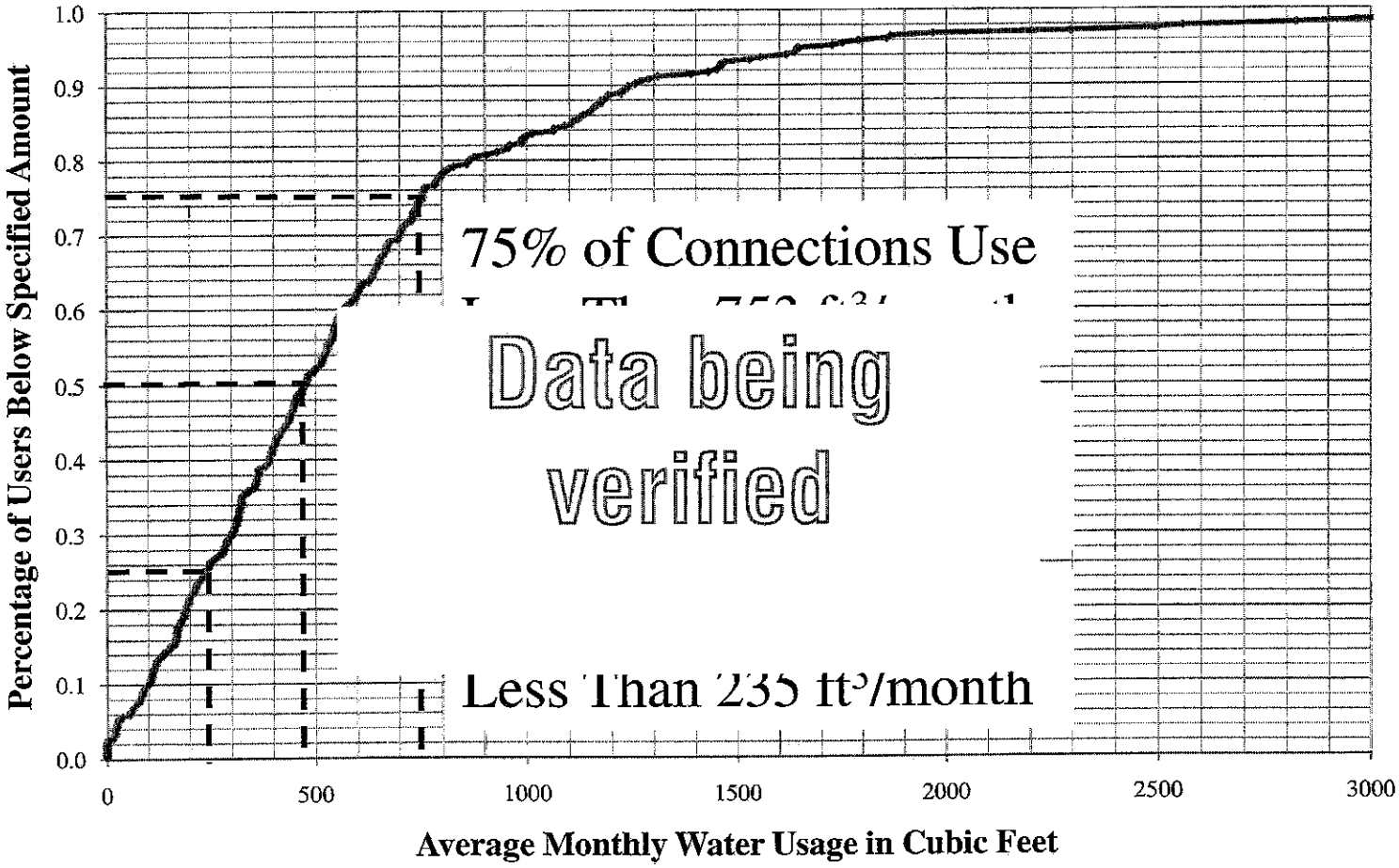
- Highest Water Users
  - School
  - Seascape/Pier
  - Trinidad Rancheria

# Customer Water Use

***Insert Water use bar graphs***

Data being verified

# Distribution of Water Users



# 3: Types of Water Rates

- Flat Rate - independent of water use
- Base/ Consumption Rate
  - Base component - uniform per customer type (residential, business, special connections)
  - Consumption Component - unit charge per volume of water
    - Uniform Rate (Current City Rate Structure)
    - Declining Block
    - Increasing Block (conservation)
    - Combination of Rate Structures
- Other - business/ residential, seasonal, fire
- Annual CPI Rate Increase

# 4: Current Water Rates

| | In-City | Outside-City |
|---|---|---|
| Minimum Charge (includes first 300ft$^3$) | $34.98 | $52.43 |
| Cost/100ft$^3$ | $2.51 | $3.79 |
| New Connection Fee (3/4" Residential meter) | $4,500 | $7,500 |

# Monthly Rates for Typical Users

| Use (Cubic Feet) | Inside | Outside |
|---|---|---|
| 100 | $34.98 | $52.43 |
| *300 | $34.98 | $52.43 |
| 500 | $41.00 | $60.01 |
| 750 | $47.53 | $71.38 |
| 1,000 | $60.08 | $90.33 |
| 2,000 | $85.18 | $128.23 |
| 5,000 | $160.48 | $241.93 |
| 10,000 | $285.98 | $431.43 |
| * Current Base Volume | | |

Uniform Block
Rate Structure

# Water Bill Affordability

- A common measure of household water affordability is the annual average water bill as a percentage of the median household income
- An EPA evaluation of household affordability set the threshold at greater than 2% of the median household income as unaffordable

$$\frac{\text{Annual Average Residential Water Bill}}{\text{Median Household Income}} > 2\%$$ Not Affordable

2009 Median Household Income, Trinidad = $45,192

At 2% MHI, Annual Average Residential Water Bill = $75.32

# 5. Recent Rate Discussions

A Several Council meetings were held in 2009 at which rates were discussed.

- February 2009
- August 2009
- November 2009

# General Rate Preferences Stated by Council in 2009

1. Promote Water Conservation.
2. Eliminate minimal allowance (300 $ft^3$) to encourage conservation in low and average users.
3. Apply an increasing consumption rate to encourage higher range users to conserve water.
4. Reduce out-of-city versus in-city rate difference.
5. Raise sufficient revenue to fund ongoing operations and maintenance of the water system (Fixed costs).
6. Raise some amount of annual revenue beyond the yearly fixed costs to increase reserve funds.

# February 2009 Presentation

## Proposal

- Zero water in base rate
- 25% higher out-of-city rates
- Separate Winter/Summer rates
- Increasing consumption rate

## Comments

- Favored reduction in rate differential between In & Out of City
- Concerned about impacts to business and high water users
- Concerned about cost impacts to trailer park residents
- Trinidad Rancheria brings outside funds to City water system, which deserves consideration in rate determination

# August 2009 Presentation

## Proposal

- Zero water in base rate
- 25% higher out-of-city rates
- Increasing consumption rate (No Winter/Summer rate difference)
- Residences with second unit charged double the base rate

## Comments

- Concerned about cost impacts to the School
- Desire to see monthly bills under proposed rates
- Assure rates collect enough funds to grow water reserve account
- Conduct a public hearing on rates in November

# November 2009 Presentation

## Proposal

- Same structure as proposed in August 2009
- Rate Structure Generated $XX

## Comments

- Favored reduction in rate differential between In & Out of City
- Trinidad Rancheria brings outside funds to City water system and assists with projects, which deserves consideration in rate determination
- Final determination on rates postponed to a future meeting

# 6: Revenues and Expenditures

- Revenues
  - Water Rate Revenue
  - Connection Fees and Late Fees
- Expenditures
  - Basic Operation Expenses
    - Staff, Utilities, Chemicals, Fees, Minor Repairs
  - Capital Replacement
    - Major System Repair & Maintenance
  - Capital Improvement
    - Regulatory Driven Upgrades and Major Projects
    - Projected Costs include: Pre-existing loan payments, Water Treatment System Upgrades, and Pipeline Replacement

# Revenues and Expenditures

| **FY 11/12 Budgeted Revenue** | |
|---|---|
| Water Rate Revenue | $ 221,000 |
| Connection & Late Fees | $ 16,000 |
| Interest | $ 20,000 |
| **TOTAL REVENUE** | $ 257,000 |
| **FY 11/12 Expenses** | |
| Basic Operational Expense | $ 254,100 |
| Capital Replacement | $ 37,000 |
| Capital Improvement | $ 67,000 |
| **TOTAL EXPENSE** | $ 358,100 |
| **DEFICIT** | $101,100 |

# 7: Other Water Rate Considerations

- Inside Versus Outside of City Rates
- Special Rates for Low Income Customers
- Annual CPI Rate Increase

# Inside versus Outside Rates

According to the American Water Works Association, there are typically 3 reasons for higher outside rates:

1) Higher outside charges are sometimes used to manage growth and annexation.
2) Outside customers are often inherently more expensive to serve because of lower densities and the fact they reside farther, on average, from the water treatment plant than inside customers.
3) Inside customers, as citizens of the City, bear more of the investment risks of owning and operating the water system. They also can bear more of the burden of financing and facilitating system operations

# Special Rates for Low Income Customers

- Current Water Rates do not differentiate between Low Income and other customers
- Differentiation of users amounts to one set of rate payers subsidizing another
- Rate structures with no water volume included in the base rate provides users with the maximum ability to control their water bill

# Agencies Contacted Regarding Utility Bill Assistance

- United Way of Humboldt County (Women and Children's Fund)
- Redwood Community Action Agency
- Area Agency on Aging
- American Association of Retired Persons
- Administration on Aging

Many agencies offer assistance with electric and telephone bills, but only the United Way Women and Children's Fund and Area Agency on Aging were found to assist with water bills in Humboldt County.

# Utility Bill Assistance

The United Way of Humboldt County/
Humboldt Area Switchboard

"Women and Children's Fund"

-Provides assistance with water bills for qualifying individuals and households.

(707) 441-1092

Area Agency on Aging

-Provides emergency funds for seniors

(707) 442-3763

# Annual CPI Rate Increase

- Annual Consumer Price Index (CPI) Rate Increase off sets the need for annual rate adjustments by increasing revenues to account for inflation.
- Current City rates adjusted annually by the percent increase in the CPI for all urban customers (CPI-U)

# 8. Discussion/ Recommendations

- Should some water be provided with the base rate?
  - Recommendation: Include no water with the base rate to promote the most conversation and provide the best opportunity for customers to lower their water bills.

- Should the City keep a rate differential between inside and outside connections?
  - Recommendation: Some liability exists for which City residents are responsible that does not exist for out of City residences. Reduce out of City differential to 10%.

# 8. Discussion/ Recommendations

- Should water consumption charges increase with more water used?
- For Example: $1.00 /100 CF for 0 to 300 CF
  $1.25/ 100 CF for 301 to 600 CF
  - Recommendation: Evaluate both keeping the uniform consumption charge and a consumption charge with moderate increase (5-10%) for higher usage blocks.
- Should the annual CPI increase be kept as part of the rate structure?
  - Recommendation: Keep the annual CPI increase

**AGENDA ITEM #5**

## SUPPORTING DOCUMENTATION FOLLOWS WITH: 2 PAGES

5. Discuss/Consider Selection of Trinidad Head Advisory Committee.

TRINIDAD CITY HALL
P.O. Box 390
409 Trinity Street
Trinidad, CA 95570
(707) 677-0223

*Kathy Bhardwaj, Mayor*
*Gabriel Adams, City Clerk*

# *VOLUNTEERS NEEDED*

* * * * * * * * * * * * * * * * * * *

# TRINIDAD HEAD ADVISORY COMMITTEE

Trinidad City Council is soliciting letters of interest from applicants to serve on a seven member committee to consider issues relating to management of Trinidad Head.

The first task of the Committee will be to clarify legal issues related to the Head:

- Determining who has regulatory authority over the Head;
- Determining who owns the Head and what are the boundaries; and
- Compiling the existing documents, treaties and agreements that regulate activities on the Head.

Additional tasks that may be considered by the Committee include:

- Identifying the top ten public concerns about the Head; and
- Determining the feasibility of organizing a trail steward program.

The committee would be expected to solicit public comments and concerns, and report its efforts to the City Council. The committee is expected to complete its work within a one year period.

***Prospective candidates should submit a letter of interest indicating the reason(s) for their interest in serving on this committee***. The council is expected to take up the matter of committee appointments at its meeting on August 10, 2011.

**Send letters of interest to**: cityclerk@trinidad.ca.gov or P.O. Box 390, Trinidad, CA 95570, or drop them off at the Town Hall located at 409 Trinity Street.

1. Stan Binnie

2. Ben Morehead: land Trust/BLM Gateway Committee

3. Virginia Waters, Native Plant Society

4. Tsurai representative: Sarah Lindgren-Akana, Tsurai Society
Secretary: Cindy Lindgren, alternate

5. Rancheria representative: Shirley Lao, Jacque Hostler alternate

6. Mareva Russo: Friends of Trinidad Head

7. Vacant. I will suggest a Planning Commissioner

**AGENDA ITEM #6**

## SUPPORTING DOCUMENTATION FOLLOWS WITH: 1 PAGES

6. Discussion/Decision regarding Supplemental Budget to Pay for New Recycling Containers

# DISCUSSION/ACTION AGENDA ITEM

Date: August 10, 2011

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**Item:** **Discussion/Decision regarding Supplemental Budget to Pay for New Recycling Containers.**

**Discussion:**
Trinidad's community recycling facility is funded though various sources: Annual grants from the Department of Conservation, tipping fees from Humboldt Waste Management Authority, and material buy-back and redemption values calculated by the ton at Humboldt Sanitation – the City's waste hauler.

The bins located at the recycling center are property of the City of Trinidad. The containers at the site are over 10 years old. The containers used to collect aluminum and steel recyclables have deteriorated, and the bottoms rusted out. Hum San had to replace the containers with new, custom bins. The cost was approximately $4500.

This expense was not anticipated when preparing the 2011-2012 budget. Staff requests from Council authorization to amend the Integrated Waste Management budget for 2011-2012 to include allocating $4500 in Capital Outlay for the purchase of the new bins described from Humboldt Sanitation.

**Proposed Action:**
Authorize $4500 in capital outlay from IWM budget reserves for the purchase of 2 new bins for the Community Recycling Center.

**Attachment:** None.

**AGENDA ITEM #7**

## SUPPORTING DOCUMENTATION FOLLOWS WITH: 12 PAGES

7. Discussion/Decision regarding Trinity & Edwards Street Signage.

**DISCUSSION/ACTION AGENDA ITEM 7**
Date: August 10, 2011

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**Item:** Improved Visibility Markings and Signage at Trinity and Edwards Streets

**Discussion:**
With the removal of the pole mounted street light at the intersection of Trinity and Edwards Streets, Winzler & Kelly was requested to provide recommendations regarding the possible need for additional traffic control and or/signage at that location. In response to that request, the City received the attached technical memo prepared by Traffic Engineer Frank Penry. That memo offers two possible alternative recommendations, one of which is to consider all-way stop control controls in concert with a number of improvements (see section 3.2 of Technical Memo). If this alternative were to be considered, further engineering study is recommended "given the regulatory setting and potential risk claims issue with the installation of official traffic control devices."

The alternative recommendation (see section 3.1 of Technical Memo) retains the existing side-street stop control and increases visibility of roadway markings and signage as follows:

- The existing marked crosswalks would be improved with white wide longitudinal strips ("ladder" style crosswalk).
- The existing centerline would be replaced with double yellow thermoplastic centerline with reflective markers.
- The existing red object marker would be replaced with one direction large arrow sign and yellow object marker

**Proposed Action:**
Authorize staff to put in place the improved visibility markings and signage as recommended in Section 3.1 of the Traffic Engineer's Technical Memo to improve visibility markings and signage at the intersection of Trinity and Edwards Streets.

**Attachment:** Technical Memorandum

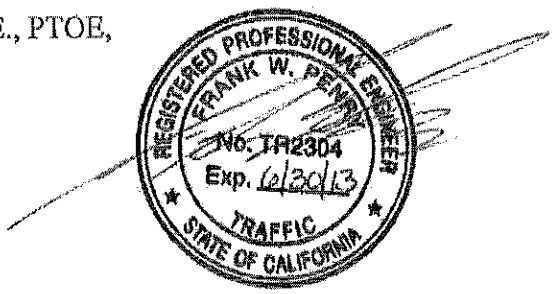
**TECHNICAL MEMORANDUM**
**City of Trinidad, Traffic Engineering Technical Assistance – Edwards Street and Trinity Street Recommendations**

WINZLER & KELLY

Reviewed by: _____
Date: _____

**PREPARED FOR:** Ms. Karen B. Suiker, City Manager, City of Trinidad

**PREPARED BY:** Frank Penry, P.E., T.E., PTOE, Winzler & Kelly




**DATE:** July 24, 2011

**JOB #:** 01063-07001-11050

## 1.0 PURPOSE AND NEED

It's our understanding that existing pole mounted street light at the intersection of Trinity Street and Edwards Street is proposed to be removed, or is in process of removal, by Pacific Gas & Electric (PG&E). The purpose of this memo is to provide the City with recommendations, which are intended to mitigate concerns at the intersection once the light has been removed.

It is important to note the recommendations contained in a previous technical memo prepared for the City on November 24, 2009. That technical memo reviewed various alternatives, the regulatory setting, and possible recommendations to address public concerns and complaints regarding issues of traffic safety on Trinity and Edwards Streets. The memo had two particular recommendations with respect to the subject location;

> ***All-Way Stop Control Controls Trinity and Edwards Street***
> *From a cursory review of the location, without adequate data to prepare a full warrant analysis, it appears that the Volume Warrant (C1 & C2) could be met when considering the two street approaches as separate. This is reasonably assumed, given that the following considerations;* ***vehicle right-of-way is potentially ambiguous with right and left-turn movements presumed to be "through", potential vehicle and pedestrian conflicts adjacent to high pedestrian volumes, and potential sight distance constraints due to parked vehicles.***
>
> *It appears within the discussion of this memo that all-way stop controls at the intersections of Trinity Street/Edwards Street would be justified within the satisfaction of at least one warrant and sound engineering judgment.*

It was noted during a recent site visit that the crosswalk on Trinity Street has been installed, as recommended below;

> ***Marked Crosswalks at the Intersection of Edwards and Trinity Streets***
> *As noted above, there is a high potential for pedestrian movement conflicts at this location given the proximity of commercial, residential, and recreational uses. The lack of fully developed pedestrian facilities is somewhat a cause for concern; however sidewalks do exist along Trinity Street and a portion of Edwards Street. There is continued presence of pedestrians regardless of facilities.*
>
> *A marked crosswalk would be recommended across Trinity Street.* ***However, due to the potentially ambiguous right-of-way, a crosswalk across Edwards is only recommended in combination with all-way stop controls at this location.***

## 2.0 EXISTING CONDITIONS

Pursuant to the recommendations for a crosswalk in the previous memo, marked crosswalks presently exist on both the north (Trinity Street) and east leg (Edwards Street) of the intersection. The intersection remains stop controlled on the westbound approach only, as the street has a marked alignment (roadway centerline stripe) of Trinity Street to the west leg of Edwards Street. The street centerline consists of a single dashed row of reflective and non-reflective raised pavement markers and there is an edgeline stripe along the south side of Edwards Street. Curbs adjacent to the intersection have all be painted red to restrict parking, facilitate vehicle movements, and improve sight distance.

Additionally, a single red object marker (end of roadway) is located along the southern side of Edwards Street, opposite the centerline of Trinity Street.

### 2.1 End-of-Roadway Markers

As noted by Section 3C.04, End-of-Roadway Markers of the California Manual on Uniform Control Devices (MUTCD); the end-of-roadway marker shall be used to warn and alert road users at the end of a road or cul-de-sac street where there is no alternate vehicular path.

## 3.0 DISCUSSION AND RECOMMENDATIONS

Given the regulatory setting and potential risk claims issue with the installation of official traffic control devices, it is recommended that the City complete an engineering study of any location of which an all-way stop signage or crosswalk markings are installed. Below is further discussion and alternate recommendations with regard to the subject intersection concerns.

### 3.1 Improved Visibility Markings and Signage

Given the potential change to ambient lighting levels at the intersections with the proposed removal of the adjacent light standard, this recommendation would retain the existing side-street stop control

and increase the visibility of roadway markings and signage. The following improvements are recommended with this alternative;

- The existing marked crosswalks should be improved with white wide longitudinal stripes (2ft wide, spaced 2 ft apart) within the existing transverse markings; commonly referred to as a "ladder" style crosswalk.

- The existing centerline should be replaced with a double yellow thermoplastic centerline, with reflective markers (Std. Detail 22), through the intersection and a minimum 50ft on each approach.

- Replace existing red object marker with One Direction Large Arrow Sign (W1-6R) and Yellow Object Marker (N-1). Signage shall face approach traffic on Trinity Street and point to the west. Standard size for the W1-6R is 48"x24". Standard size for the N-1 is 18"x18".

    - Alternately, three (3) Chevron Alignment Signs (W1-8R) may be used instead of the Large Directional Arrow Sign and Object Marker. Standard size for each W1-8R is 18"x24".

## 3.2 All-Way Stop Control Controls

As noted previously, it appears that the all-way stop volume warrant may be met when considering the two street approaches. However, given the special circumstances; such as vehicle right-of-way, potential vehicle and pedestrian conflicts, potential sight distance constraints, and ambient lighting levels, engineering judgment would support the installation of all-way stop controls without substantial traffic volumes. With this recommendation of all-way stop control at the subject intersection, the following improvements should be included with this alternative;

- New Stop signs (R1-1) should be place on both the uncontrolled approaches of Edward Street and Trinity Street. A new stop bar would accompany the stop signage on the west leg of Edward Street.

- The existing centerline markers should be removed within the intersection. Replace existing centerline stripe with double yellow thermoplastic centerline (Std. Detail 21) a minimum 50ft on each approach.

- Replace existing red object marker with Two-Direction Large Arrow Sign (W1-7) and Yellow Object Marker (N-1). Signage shall face approach traffic on Trinity Street.

- As noted in the previous study, with the provision for all-way stop control at this intersection, all three legs of the intersection may have marked crosswalks. The new marked crosswalk would be installed instead of the new stop bar.

- Temporary "Changed Conditions" warning signage should be placed in advance of the intersection, on each approach. Temporary flags should be affixed to the stop signage.

- As an option, the existing marked crosswalks may be improved with white wide longitudinal stripes (2ft wide, spaced 2 ft apart) within the existing transverse markings; commonly referred to as a "ladder" style crosswalk.

## 4.0 ATTACHMENTS

California MUTCD, Section2C.09
California MUTCD, Section2C.39
California MUTCD, Section3C.04

The Reverse Turn (W1-3) sign or the Reverse Curve (W1-4) sign may be combined with the Advisory Speed (W13-1) plaque (see Section 2C.46) to create a combination Reverse Turn/Advisory Speed (W4-1(CA)) sign (see Figure 2C-1), or combination Reverse Curve/Advisory Speed (W4-18(CA)) sign (see Figure 2C-1).

The Hairpin Curve (W1-11) sign or the 270-degree Loop (W1-15) sign may be combined with the Advisory Speed (W13-1) plaque (see Section 2C.46) to create a combination Hairpin Curve /Advisory Speed (W4-10(CA)) sign (see Figure 2C-1), or combination 270-degree Loop/Advisory Speed (W4-14(CA)) sign (see Figure 2C-1).

The Truck Rollover Warning (W1-13) sign may be combined with the Advisory Speed (W13-1) plaque (see Section 2C.46) to create a combination Truck Rollover Warning /Advisory Speed (W4-22(CA)) sign (see Figure 2C-1).

**Standard:**

**When used, the combination Horizontal Alignment/Advisory Speed sign shall supplement other advance warning signs and shall be installed at the beginning of the turn or curve.**

Guidance:

When used, the combination Horizontal Alignment/Advisory Speed sign should be installed at the beginning of the turn or curve

Support:

The combination Turn/Advisory Speed (W1-1a) sign or combination Curve/Advisory Speed (W1-2a) sign (see Figure 2C-1) is used at problem locations where the Horizontal Alignment (W1-1 through W1-5) signs have not proven to be effective.

Standard:

**When used, combination Turn/Advisory Speed (W1-1a) sign or combination Curve/Advisory Speed (W1-2a) sign (see Figure 2C-1) shall be used in the head-on position and/or at the beginning of the turn or curve.**

Guidance:

When used, the square shape should be used in the head-on position for combination Turn/Advisory Speed (W1-1a) sign or combination Curve/Advisory Speed (W1-2a) sign (see Figure 2C-1).

When used, the diamond shape should be used in the beginning of the turn or curve for the combination Turn/Advisory Speed (W1-1a) sign or combination Curve/Advisory Speed (W1-2a) sign (see Figure 2C-1).

Existing pavement markings should also be evaluated.

Standard:

**The advisory speed shall be determined in accordance with Section 2C.101(CA).**

## Section 2C.08 Combination Horizontal Alignment/Intersection Sign (W1-10)

Option:

The Turn (W1-1) sign or the Curve (W1-2) sign may be combined with the Cross Road (W2-1) sign or the Side Road (W2-2 or W2-3) sign to create a combination Horizontal Alignment/Intersection (W1-10) sign (see Figure 2C-1) that depicts the condition where an intersection occurs within a turn or curve.

Guidance:

Elements of the combination Horizontal Alignment/Intersection sign related to horizontal alignment should conform to Section 2C.06, and elements related to intersection configuration should conform to Section 2C.37. No more than one Cross Road or two Side Road symbols should be shown on any one combination Horizontal Alignment/Intersection sign.

## Section 2C.09 One-Direction Large Arrow Sign (W1-6)

Option:

A One-Direction Large Arrow (W1-6) sign (see Figure 2C-1) may be used to delineate a change in horizontal alignment.

**Standard:**

**The One-Direction Large Arrow sign shall be a horizontal rectangle with an arrow pointing to the left or right.**

**If used, the One-Direction Large Arrow sign shall be installed on the outside of a turn or curve in line with and at approximately a right angle to approaching traffic.**

**The One-Direction Large Arrow sign shall not be used where there is no alignment change in the direction of travel, such as at the beginnings and ends of medians or at center piers.**

Guidance:

The One-Direction Large Arrow sign should be visible for a sufficient distance to provide the road user with adequate time to react to the change in alignment.

Type N-1(CA) (OM1-3) object marker should be used below and on the same post as the W1-6 sign. See Chapter 3C.

## Section 2C.10 Chevron Alignment Sign (W1-8)

Option:

The Chevron Alignment (W1-8) sign (see Figure 2C-1) may be used to provide additional emphasis and guidance for a change in horizontal alignment. A Chevron Alignment sign may be used as an alternate or supplement to standard delineators on curves or to the One-Direction Large Arrow (W1-6) sign.

**Standard:**

**The Chevron Alignment sign shall be a vertical rectangle. No border shall be used on the Chevron Alignment sign.**

**If used,** a minimum of three **Chevron Alignment signs shall be installed on the outside of a turn or curve, in line with and at approximately a right angle to approaching traffic.**

Option:

A Chevron Alignment sign may be used on the far side of an intersection to inform drivers of a change of horizontal alignment for through traffic.

Guidance:

Spacing of Chevron Alignment signs should be such that the road user always has at least two three in view, until the change in alignment eliminates the need for the signs.

Chevron Alignment signs should be visible for a sufficient distance to provide the road user with adequate time to react to the change in alignment.

## Section 2C.11 Truck Rollover Warning Sign (W1-13)

Option:

A Truck Rollover Warning (W1-13) sign (see Figure 2C-1) may be used to warn drivers of vehicles with a high center of gravity, such as trucks, tankers, and recreational vehicles, of a curve or turn having geometric conditions that are prone to cause such vehicles to lose control and overturn.

**Standard:**

**When the Truck Rollover Warning (W1-13) sign is used, it shall be accompanied by an Advisory Speed (W13-1) plaque indicating the recommended speed for vehicles with a higher center of gravity.**

Option:

The Truck Rollover Warning sign may be displayed either as a static sign, a static sign supplemented by a flashing warning beacon, or as a changeable message sign activated by the detection of an approaching vehicle with a high center of gravity that is traveling in excess of the recommended speed for the condition.

Support:

The curved arrow on the Truck Rollover Warning sign shows the direction of roadway curvature. The truck tips in the opposite direction.

## Section 2C.12 Hill Signs (W7-1, W7-1a, W7-1b)

Guidance:

The Hill (W7-1) sign (see Figure 2C-2) should be used in advance of a downgrade where the length, percent of grade, horizontal curvature, and/or other physical features require special precautions on the part of road users.

The Hill sign and supplemental grade (W7-3) plaque (see Section 2C.48) used in combination, or the W7-1b sign used alone, should be installed in advance of downgrades for the following conditions:

A. 5% grade that is more than 900 m (3,000 ft) in length;
B. 6% grade that is more than 600 m (2,000 ft) in length;
C. 7% grade that is more than 300 m (1,000 ft) in length;
D. 8% grade that is more than 230 m (750 ft) in length; or

The relative importance of the intersecting roadways may be shown by different widths of lines in the symbol.

An advance street name plaque (see Section 2C.49) may be installed above or below an Intersection Warning sign.

Guidance:

The Intersection Warning sign should illustrate and depict the general configuration of the intersecting roadway, such as cross road, side road, T-intersection, or Y-intersection.

Intersection Warning signs, other than the Circular Intersection symbol (W2-6) sign and the T-Intersection symbol (W2-4) sign, should not be used on approaches controlled by STOP signs, YIELD signs, or signals. The Circular Intersection symbol (W2-6) sign should be installed on the approach to a YIELD sign controlled roundabout intersection.

Where the side roads are not opposite of each other, the symbol for the intersection should indicate a slight offset.

Option:

A bulb shape may be placed on the appropriate leg of the Cross Road (W2-1), Side Road (W2-2 or W2-3), T-Symbol (W2-4), or Y-Symbol (W2-5) advance intersection signs to indicate a "Dead End" condition. See Section 2C.21 for DEAD END (W14-1) sign.

Guidance:

The END FREEWAY _____ MI (W69(CA)) sign should be used at locations where traffic leaving the freeway comes into a lower standard roadway. At problem locations dual installations with yellow flashing beacons or overhead installations should be considered. The W69(CA) sign should also be used at transitions from freeways to expressways.

Option:

The END FREEWAY sign (SW36(CA)) may be used at locations where traffic leaving the freeway comes into a lower standard roadway. It may also be used where additional emphasis is needed for the W69(CA) sign.

Guidance:

The CROSS TRAFFIC AHEAD (W70(CA)) sign should be used at locations where traffic leaves a freeway section and enters an expressway section to warn motorists that crossing at grade may be expected.

Option:

Where two sections of freeway are connected by a section of expressway of a relatively short distance, the Next Distance (W7-3a) plaque may be installed below the W70(CA) sign.

Support:

See Figure 2C-8(CA) for W69(CA), W70(CA) and SW36(CA) signs.

## Section 2C.38 Two-Direction Large Arrow Sign (W1-7)

**Standard:**

**The Two-Direction Large Arrow (W1-7) sign (see Figure 2C-8) shall be a horizontal rectangle.**

**If used, it shall be installed on the far side of a T-intersection in line with, and at approximately a right angle to, approaching traffic.**

**The Two-Direction Large Arrow sign shall not be used where there is no change in the direction of travel such as at the beginnings and ends of medians or at center piers.**

Guidance:

The Two-Direction Large Arrow sign should be visible for a sufficient distance to provide the road user with adequate time to react to the intersection configuration.

Type N-1(CA) (OM1-3) object marker should be used below and on the same post as the W1-7 sign. Refer to Chapter 3C.

## Section 2C.39 Traffic Signal Signs (W25-1, W25-2)

**Standard:**

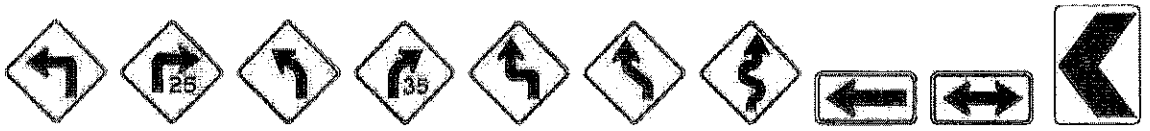
~~Unless a separate left-turn signal face is provided and is operated as described in Section 4D.06, if the possibility exists that a CIRCULAR YELLOW signal indication could be displayed to an approach from which drivers are turning left permissively without the simultaneous display of a CIRCULAR YELLOW signal indication to the opposing approach (see Section 4D.05), either a W25-1 or a W25-2~~

# California Sign Chart

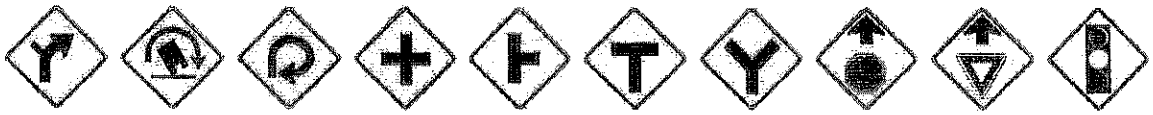
*Sheet 4 of 10 - Federal Warning Signs*

This chart contains commonly used signs in California, and is not meant to be used as a comprehensive sign chart.
California codes are designated by (CA). Otherwise Federal codes are shown. For a complete directory of signs, visit www.dot.ca.gov/hq/traffops/signtech/signdel/index.htm.

California Department of Transportation
Signs and Work Zones Branch
September 2006




W1-1 W1-1a W1-2 W1-2a W1-3 W1-4 W1-5 W1-6 W1-7 W1-8



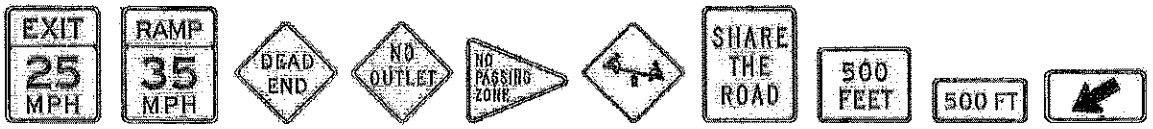
W1-10 W1-13 W1-15 W2-1 W2-2 W2-4 W2-5 W3-1 W3-2 W3-3


W3-3a W4-1 W4-2 W4-3 W4-4p W4-7 W5-1 W5-2 W5-3 W6-1


W6-2 W6-3 W7-1b W7-2b W7-3 W7-3a W7-3b W7-4 W7-4b W8-1


W8-2 W8-3 W8-4 W8-5 W8-8 W9-1 W10-1 W10-1a W10-2 W10-12


W11-1 W11-2 W11-3 W11-4 W11-5 W11-7 W12-1 W12-2 W12-2p W13-1




W13-2 W13-3 W14-1 W14-2 W14-3 W15-1 W16-1 W16-2 W16-2a W16-7p


W16-9p S1-1 S3-1 S4-3 S4-5 S4-5a

Option:

If engineering judgment indicates that the exit gore at an interchange cannot be negotiated in a reasonably safe manner, then in addition to the Type F and G delineators, Type R(CA) (OM-3C) object marker may be used as shown in Figure 3D-102(CA).

**Section 3C.04 End-of-Roadway Markers**

Support:

The end-of-roadway marker is used to warn and alert road users of the end of a roadway in other than construction or maintenance areas.

**Standard:**

**The end-of-roadway marker (see Figure 3C-1) shall be one of the following: a marker consisting of nine red retroreflectors, each with a minimum diameter of 75 mm (3 in), mounted symmetrically on a red (OM4-1) or black (OM4-2) diamond panel 450 mm (18 in) or more on a side; or a retroreflective red diamond panel (OM4-3) 450 mm (18 in) or more on a side.**

Option:

~~The end-of-roadway marker may be used in instances where there are no alternate vehicular paths.~~

Standard:

The end-of-roadway marker shall be used at the end of a road or cul-de-sac street where there is no alternate vehicular path.

Where conditions warrant, more than one marker, or a larger marker with or without a Type III barricade (see Section 3F.01), may be used at the end of the roadway.

**Standard:**

**~~The minimum mounting height to the bottom of an end-of-roadway marker shall be 1.2 m (4 ft) above the edge of the pavement.~~** Figure 3C-1(CA) shall be used for mounting height of the end-of-the-roadway marker.

Guidance:

Appropriate advance warning signs (see Chapter 2C) should be used.

Support:

See Section 2C.21 for use of end-of-roadway marker in conjunction with END (W31(CA)) sign.

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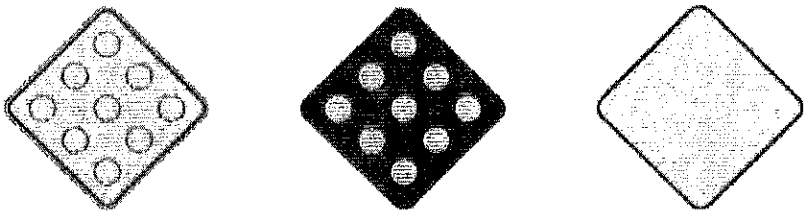
## *Figure 3C-1. Object Markers and End-of-Roadway Markers*

### *Type 1 Object Markers*

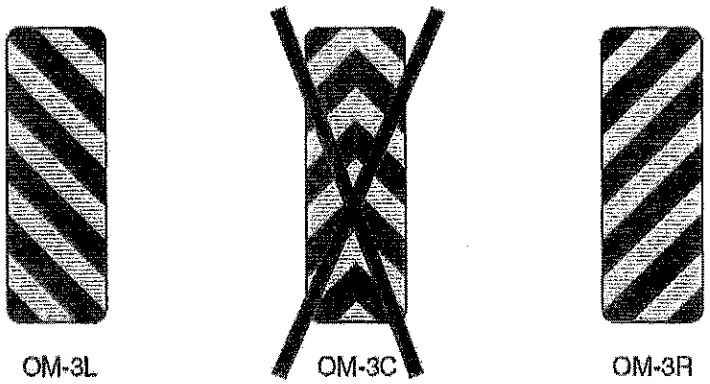


OM1-1 OM1-2 OM1-3

### *Type 2 Object Markers*

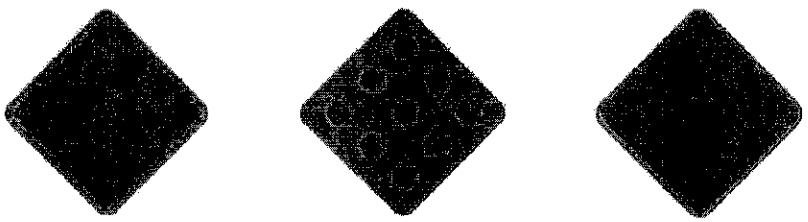
OM2-1V OM2-2V OM2-1H OM2-2H

### *Type 3 Object Markers*



OM-3L OM-3C OM-3R

### *End-of-Roadway Markers*



OM4-1 OM4-2 OM4-3

*Figure 3C-1 (CA). California Object Markers and End-of-Roadway Markers (Sheet 1 of 2)*